# **Chapter 10-60: Specific to Thoroughfares**

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# Division 10-60.10: Thoroughfare Types

#### **Sections:**

10-60.10.010	Purpose
10-60.10.020	Applicability
10-60.10.030	Allowed Thoroughfares
10-60.10.040	Functions of Thoroughfares
10-60.10.050	Speed/Movement Types
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10-60.10.070	Other Considerations
10-60.10.080	Thoroughfare Components
10-60.10.090	Thoroughfare Assemblies

# 10-60.10.010 Purpose

This Division provides illustrations, descriptions, and standards for thoroughfares (streets) in areas of the City where transect zones may be applied. Thoroughfare components include lane configurations, parking, edge treatments, and frontages, among others. The standards of this Division are supplemental to those contained in the *Engineering Standards*. These standards are intended to promote walkable, safe street environments. Standards for appropriate street trees and public lighting are also provided.

# 10-60.10.020 Applicability

- A. This Division describes the standards for development of thoroughfares in walkable environments throughout the City. It supplements the *Engineering Standards*. Where these standards conflict with the *Engineering Standards*, the standards of the *Engineering Standards* shall apply.
- B. These thoroughfare standards are applicable for the transformation of existing streets or the creation of new streets in any areas within the transect zones.
- C. The standards set forth in this Division may also be used in the non-transect zones with Director or City Engineer approval.
- D. Additional thoroughfare assemblies can be integrated into this Division as they are approved by the City.

# 10-60.10.030 Allowed Thoroughfares

The following thoroughfares are allowed:

- A. Predefined thoroughfare assemblies found in Section 10-60.10.90 (Thoroughfare Assemblies).
- B. Thoroughfares that match the standards found in Table 10-60.10.080.A (Summary Thoroughfare Components) and use the predefined components in Tables 10-60.10.080.B-F.
- C. Thoroughfares that match the standards found in Table 10-60.10.080.A (Summary Thoroughfare Components) but do not use the predefined components in Tables 10-60.10.080.B-F shall require a review and approval by the City Engineering Section, Public Works Division, and Flagstaff Fire Department representatives.

# 10-60.10.040 Functions of Thoroughfares

The design of thoroughfares significantly shapes the form and character of cities, towns, and neighborhoods. An understanding of a thoroughfare's function helps to determine the correct application of a thoroughfare type in transect zones. The five basic functions of movement are the street as a:

#### A. Carrier

The thoroughfare serves as a carrier or conveyor of pedestrians, vehicles, bicycles, trucks, and other transportation modes.

#### B. Connector

The thoroughfare serves to connect one or more activities or uses that are separated from each other.

# C. Space/Shelter

The thoroughfare or the public realm serves an important role as a location for public activity, such as cafes, restaurants, and outdoor shopping. Creating a safe walkable streetscape is important for the successful achievement of this function.

#### D. Symbol

As a symbol, the design of a thoroughfare can provide messages and information about a place, enable drivers and pedestrians to find specific locations or activities, and to use the street as a means of orientation and place-finding. It can also have a monumental or symbolic function. Route 66 is a good example of a thoroughfare with symbolic meaning.

#### E. City Builder or Destroyer

The thoroughfare as described here may enhance land values, land uses, and architectural scale, or destroy these if improperly regarded. In other words,

thoroughfares can create a strong sense of community, or if not carefully designed, break down and even divide a community.

# 10-60.10.050 Speed/Movement Types

A. The design speed for pedestrian safety and mobility is the primary determinant of movement types. Movement types associated with assigned lane widths and curb radii are applied in each transect zone.

#### 1. Yield

Drivers must proceed slowly, with extreme care and must yield to approaching traffic when vehicles are parked on both sides of the thoroughfare. A yield street is the functional equivalent of traffic calming. Design speed of 20 mph or less.

#### 2. Slow

Drivers can proceed carefully with an occasional stop to allow a pedestrian to cross or another car to park. The character of the street should make drivers uncomfortable exceeding the design speed due to the presence of parked cars, sense of enclosure from buildings and street trees, tight turning radii, and other design elements. Design speed of 20 mph.

#### 3. Free

Drivers can generally expect to travel without delay at the appropriate design speed. Street design supports safe pedestrian movement at the higher design speed. This movement type is appropriate for thoroughfares designed to traverse longer distances or connect to higher intensity locations. Design speed of 25 mph.

#### 4. Speed

Drivers can expect travel similar to conventional suburban street design but with continued emphasis on pedestrian safety and comfort. Design speed of 30 mph.

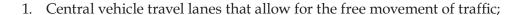
#### 5. Rural

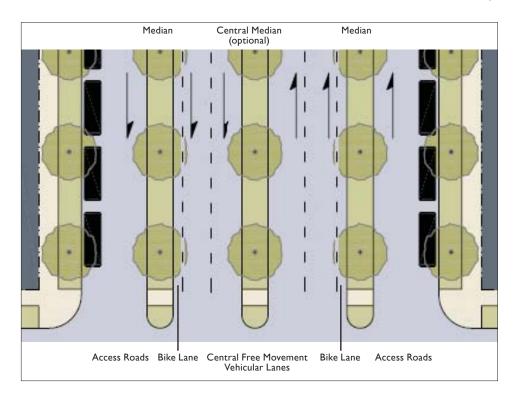
This is a conventional street design in which drivers can expect a separation of modes (i.e. bike lanes, walking paths and roads) allowing automobile travel to be unimpeded by pedestrians or walkability concerns. This movement type is rarely used in traditional town planning, but may be needed when a thoroughfare crosses through T1 or T2 Transect Zones. Design speed may be above 35 mph.

B. The design criteria for Yield, Slow, and Free Streets shall be commensurate with local streets and the Speed and Rural with minor collector streets.

# 10-60.10.060 Boulevards as Arterials and Major Collectors in Transect Zones

- A. Major and minor arterial roads and major collector roads as described and mapped in the General Plan should ideally be placed on the periphery of proposed traditional neighborhood districts. This ensures that the arterial and major collector roads maintain their integrity to convey vehicles effectively, and that the neighborhood maintains its integrity as a walkable neighborhood. Where these arterial and major collector roads are located on the edge of a proposed neighborhood or cross through it when no other alternative location is practical or feasible, then the arterial and major collector road should be designed as a boulevard.
- B. Boulevards are a thoroughfare designed for high vehicular capacity and moderate to high speeds that contain the following features:





- 2. A bike lane will typically be provided adjacent to the outer most central vehicle travel lanes;
- 3. Medians that buffer between the central free movement vehicluar lanes and access roads. An optional median may be placed between the opposing directions of travel in the central vehicular lanes. In order to ensure the safety of pedestrians crossing the boulevard, all medians shall be a minimum width of eight feet to provide a pedestrian refuge; and,
- 4. An access road, also known as a frontage road, that is designed for slow speeds on the outer edge of the right-of-way and separated from the faster

vehicle lanes by a median as illustrated on the previous page. Bicycles can also be safely accommodated along the access road.

C. With this design, a boulevard satisfies the carrier and connector functions required of a regional arterial network, while also accommodating the space/shelter functions of a thoroughfare in a traditional neighborhood. See Table D for examples of different boulevards.

#### 10-60.10.070 Other Considerations

Other factors that may need to be considered in the selection of an appropriate thoroughfare type in transect zones could include the following:

#### A. Topography

Thoroughfares that traverse steep slopes may need to incorporate additional design consideration for such elements as drainage facilities, bicycle lanes on the uphill side of the street, etc.

#### B. Parking

Parking availability on site or on the thoroughfare will determine the appropriate thoroughfare type. Parking will also be determined by lot size and use.

#### C. Truck Access

Thoroughfares that provide access to high volumes of large trucks may need additional design considerations to mitigate potential negative effects on walkability.

#### D. Bus Service

Thoroughfares that will serve as a public transit or school bus route may need additional design considerations, including, but not limited to, the location of bus stops.

# 10-60.10.080 Thoroughfare Components

- A. Requirements for pedestrian safety and mobility establish thoroughfare design speed. Design speed then determines the dimensions of each thoroughfare element, such as vehicular lanes and turn radii.
- B. Thoroughfares shall be designed according to the types of vehicles expected to use each thoroughfare on a daily basis. Occasionally, large vehicles are expected on all thoroughfares. All thoroughfares shall allow these vehicles to safely pass without major difficulty. It is expected that large vehicles may cross the centerline when making turning movements.

C. A Thoroughfare Selection Report shall be prepared for all new developments subject to the provisions of this Division and submitted to the City Traffic Engineer for review and approval. The Thoroughfare Selection Report may be included as part of a required Traffic Impact Analysis or Traffic Impact Study. The Thoroughfare Selection Report shall demonstrate what criteria or rationale were used for selecting thoroughfare types.

Table 10-60.10.080.A Sun	nmary Tho	roughfare	Compone				
TI and T2 Movement Type	Speed	Travel Lane <sup>1</sup>	Bicycle Facility <sup>3, 4</sup>	Parking Lane (if provided)	Edge	Parkway Min.	Path Min.
Slow	20 mph	8'			R	5' - 10'	8' - 10'
Free	25 mph	9'			R or C	5' - 10'	8' - 10'
Speed 30	30 mph	10'	Р		R or C	5' - 10'	8' - 10'
Rural	35 mph	11'	Р		R or C	5' - 10'	8' - 10'
T3 Movement Type	Speed	Travel Lane <sup>1</sup>	Bicycle Facility <sup>3, 4</sup>	Parking (if provided)	Edge	Parkway Min.	Sidewalk Min.
Yield <sup>2</sup>	20 mph	12'		7'	С	5' - 10'	5'
Lots > 1 acre	20 mph	8'			R or C	5' - 10'	5'
Slow	20 mph	9'		7'	С	5' - 10'	5'
Free	25 mph	10'		8'	С	5' - 10'	5'
Speed 30	30 mph	10'	Р	8'	С	5' - 10'	5'
Rear Lane <sup>2</sup>	n/a	12'			R or RB	4'	
T4 Movement Type	Speed	Travel Lane <sup>1</sup>	Bicycle Facility <sup>3, 4</sup>	Parking (if provided)	Edge	Parkway Min.	Sidewalk Min.
Yield <sup>2</sup>	20 mph	12'		7'	С	5'	6'
Slow	20 mph	9'		7'	С	5'	6'
Slow (w/ 45° angle parking)	20 mph	12'		18'	С	7'	6'
Free	25 mph	10'	Р	8'	С	5'	6'
Free (w/ 45° angle parking)	25 mph	12'		18'	С	7'	6'
Speed 30	30 mph	10'	Р	8'	С	5'	6'
Alley <sup>2</sup>	n/a	21'			RB		
T5 Movement Type	Speed	Travel Lane <sup>1</sup>	Bicycle Facility <sup>3, 4</sup>	Parking (if provided)	Edge	Furnishing	Sidewalk Min.
Slow	20 mph	9'		7'	С	5' min.	8'
Slow (w/ 45° angle parking)	20 mph	12'		18'	С	5' - 7'	8'
Free	25 mph	10'	Р	8'	С	5' min.	8'
Free (w/ 45° angle parking)	25 mph	12'		18'	С	5' - 7'	8'
Speed 30	30 mph	11'	Р	8'	С	5' min.	8'
<del></del>	n/a	21'			RB		

Table 10-60.10.080.A Summary Thoroughfare Components (continued)							
T6 Movement Type	Speed	Travel Lane <sup>1</sup>	Bicycle Facility <sup>3, 4</sup>	Parking Lane (if provided)	Edge	Furnishing Min.	Sidewalk Min.
Slow	20 mph	8'		7'	С	5' min.	8'
Slow (w/ 45° angle parking)	20 mph	12'		18'	С	5' - 7'	8'
Free	25 mph	9'	Р	8'	С	5' min.	8'
Speed 30	30 mph	11'	Р	8'	С	5' min.	8'
Alley <sup>2</sup>	n/a	21'			RB		

#### **End Notes**

- <sup>1</sup> All lane dimensions shall be measured to the face of the curb. Where no curb and gutter is provided, the lane dimension shall be to the edge of the asphalt. In transects TI and T2, add I.5 feet to the travel lane width if curb and gutter are used and there is no on-street parking. Where parallel on-street parking is allowed and provided, travel lane width shall increase by one foot.
- <sup>2</sup> Assumes two-way traffic. The 12' dimension for a yield street is a single lane for 2-way traffic when vehicles are parked on both sides.
- <sup>3</sup> Bike lanes may also be required where uphill grades exceed 7% or to provide continuity between neighborhoods.
- <sup>4</sup> A sharrow or bicycle boulevard is allowed on streets with a design speed of less than 25 mph.

Key R = Rural Edge Treatment C = Curb Edge Treatment RB = Ribbon Curb (18")
P = Permitted --= Not Permitted

# Table 10-60.10.080.B Bicycle Facilities Standards Class I: Multi-Use Trail Width 10' min.

# Table 10-60.10.080.B Bicycle Facilities Standards

Class I	l: E	Bicy	cle	Lane
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Width Adjacent to

Rural Edge 4' Parking 5'

Curb and Gutter 6' to edge of curb

Class III: Sharrow/Bicycle Boulevard					
Width	no minimum				
Design Speed of Thoroughfare	<25 mph				

Cycle Track <sup>6</sup>	
Width	6' min.

# **End Notes**

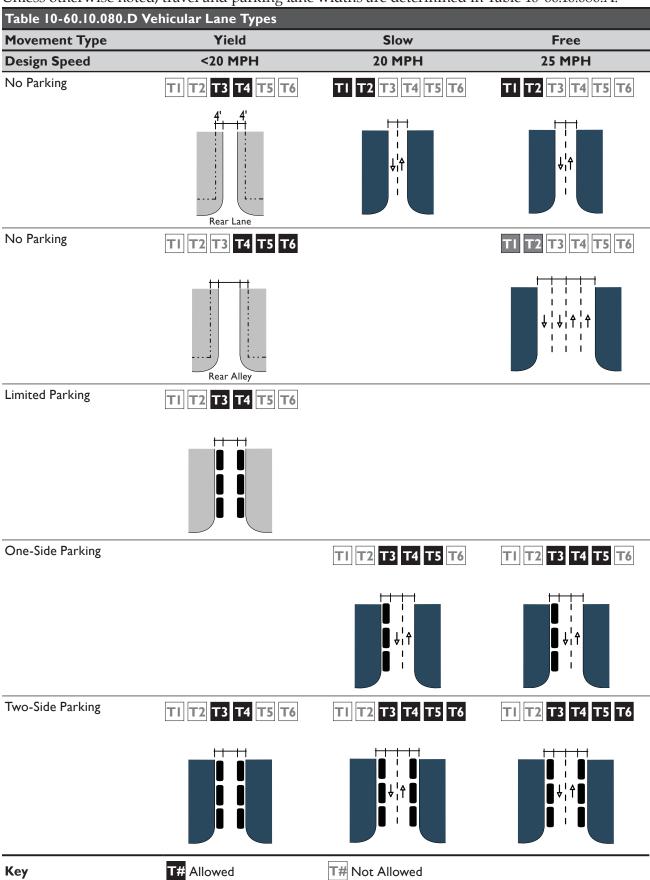
# Table 10-60.10.080.C Curb Radius

This table provides the radius for curbs at the intersection of thoroughfares.

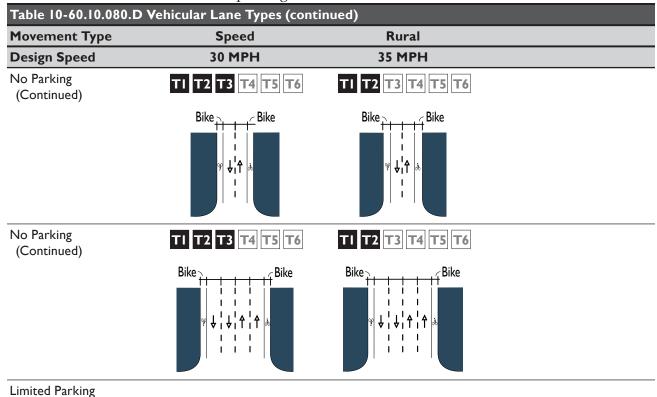
Massaurant Tons	Smand	Curb Radius with
Movement Type	Speed	Parking
Yield	20 mph	10'
Slow	20 mph	5' - 10'
Free	25 mph	10' - 15'
Speed	30 mph	15' - 20'
Rural	35 mph	25'

<sup>&</sup>lt;sup>6</sup> In Transect Zones T5 and T6 a cycle track may be provided in lieu of a bike lane.

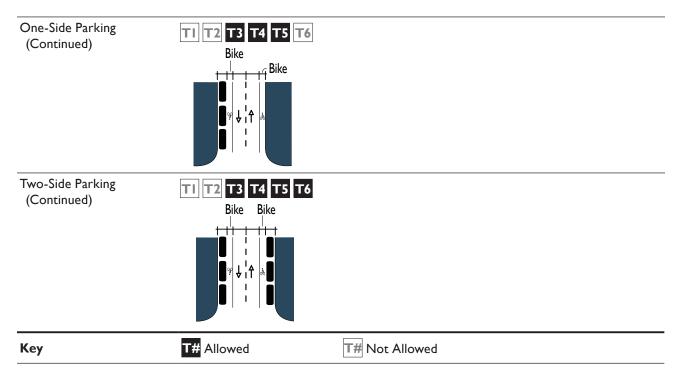
Unless otherwise noted, travel and parking lane widths are determined in Table 10-60.10.080.A.



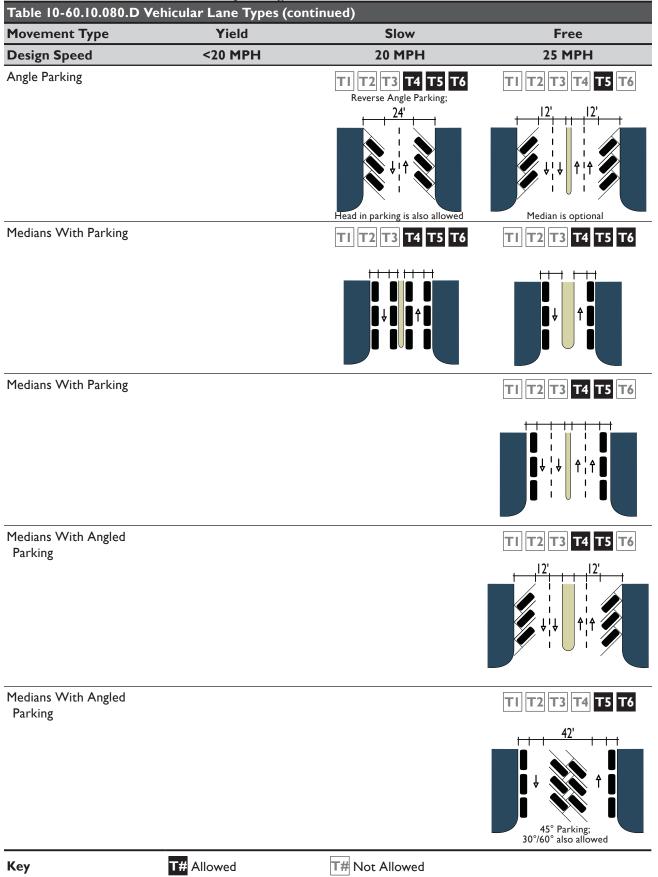
Unless otherwise noted, travel and parking lane widths are determined in Table 10-60.10.080.A.



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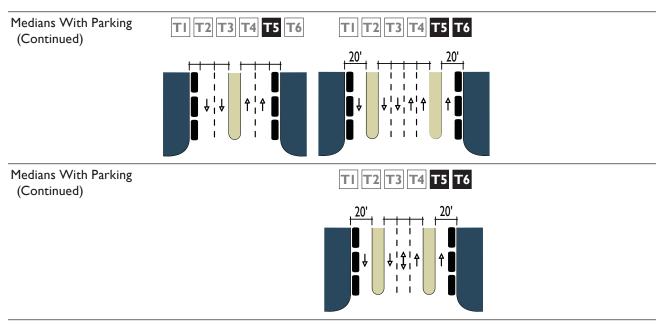
Unless otherwise noted, travel and parking lane widths are determined in Table 10-60.10.080.A.



Unless otherwise noted, travel and parking lane widths are determined in Table 10-60.10.080.A.

Table 10-60.10.080.D Vehicular Lane Types (continued)								
<b>Movement Type</b>	Speed	Speed						
Design Speed	30 MPH	35 MPH						

Angle Parking (Continued)



Medians With Angled Parking (Continued)

Medians With Angled Parking (Continued)

# Table 10-60.10.080.E Public Frontages Types

The public frontage is the area between the curb of the vehicular lanes and the frontage line. Dimensions are provided in Table F (Public Frontage Standards).

Public Frontage Type	LOT/ PRIVATE PUBLIC FRONTAGE FRONTAGE	Transect Zone
<b>Highway (HW):</b> The Highway Frontage has bicycle trails, no parking and open swales drained by percolation. The landscaping consists of the natural condition or multiple species arrayed in naturalistic clusters. Buildings are buffered by distance or berms.		TI T2 T3 T4 T5 T6
<b>Road (RD):</b> The Road Frontage has open swales drained by percolation, a walking path or bicycle trail along one or both sides, and yield parking. The landscaping consists of multiple species arrayed in naturalistic clusters.		TI T2 T3 T4 T5 T6
<b>Street (ST):</b> The Street Frontage has raised curbs drained by inlets and sidewalks separated from the vehicular lanes by individual or continuous planters. The landscaping consists of street trees of a single or alternating species aligned in a regularly spaced allee. <sup>1</sup>		TI T2 T3 T4 T5 T6
<b>Drive (DR):</b> The Drive Frontage has raised curbs drained by inlets and a wide sidewalk or paved path along one side, related to a Civic Space. It is separated from the vehicular lanes by individual or continuous planters. The landscaping consists of street trees of a single or alternating species aligned in a regularly spaced allee.		TI T2 T3 T4 T5 T6
Avenue (AV): The Avenue Frontage has raised curbs drained by inlets and wide sidewalks separated from the vehicular lanes by a narrow continuous planter with parking on both sides. The landscaping consists of a single tree species aligned in a regularly spaced allee.		TI T2 T3 T4 T5 T6
Commercial Street (CS) or Avenue: The Commercial Street or Avenue Frontage has raised curbs drained by inlets and very wide sidewalks along both sides separated from the vehicular lanes by separate tree wells with grates. The landscaping consists of a single tree species aligned with regular spacing where possible.		TI T2 T3 T4 T5 T6

Key T# Allowed T# Not Allowed

 $<sup>^{\</sup>rm 1}$  Streets with a right-of-way width of 40 feet or less are exempt from tree standards.

# Table 10-60.10.080.E Public Frontages Types (continued)

The public frontage is the area between the curb of the vehicular lanes and the frontage line. Dimensions are provided in Table F (Public Frontage Standards).

Public Frontage Type (continued)	LOT/ PRIVATE FRONTAGE	R.O.V	 Transect Zone
<b>Boulevard (BV)</b> : The Boulevard Frontage has slip roads on both sides. It consists of raised curbs drained by inlets and sidewalks along both sides, separated from the vehicular lanes by planters. The landscaping consists of double rows of a single tree species aligned in a regularly spaced allee.			T1 T2 T3 T4 T5 T6
Rear Alley (RA): The Rear Alley Frontage is located to the rear of lots. It consists of a paved surface and ribbon curb at the edges adjacent to property lines or buildings. Alleys are typically not landscaped.			T1 T2 T3 T4 T5 T6
Rear Lane (RL): The Rear Lane Frontage is located to the rear of lots. It consists of a paved surface and compacted gravel or similar material placed on the outer edges. Lanes are typically not landscaped.			TI T2 T3 T4 T5 T6

# Table 10-60.10.080.F Public Frontage Standards

This table assembles prescriptions and dimensions for the public frontage elements - curbs, walkways, and planters - relative to specific thoroughfare types within transect zones. Assembly combines the Curb, Walkway, and Planter for the various street types.

Transect Zone	TI T2 T3 T4 T5 T6	TI T2 T3 T4 T5 T6	TI T2 T3 T4 T5 T6
Public Frontage Type	HW-RD-ST	RD & ST	ST-DR-AV
Assembly: The principal variables are the type and dimension of curbs, walkways, planters and landscape.			
Total Width	13' - 22'	13' - 22'	10' - 17'
<b>Curb:</b> The detailing of the edge of the vehicular pavement, incorporating drainage.			
Туре	Rural	Raised Curb	Raised Curb
Radius	25'	10' - 30'	5' - 20'
Walkway: The pavement dedicated exclusively to pedestrian activity.			
Туре	Path	Sidewalk	Sidewalk
Width	5' - 10'	5' min.	5' min.
<b>Planter:</b> The layer which accommodates street trees and other landscape.			
Arrangement	Clustered	Clustered	Regular
Species	Multiple	Multiple	Multiple
Туре	Continuous Planter	Continuous Planter	Continuous Planter
Width	5' min.	5' min.	5' min.

Key	T# Allowed	T# Not Allowed
•		

# Table 10-60.10.080.F Public Frontage Standards (continued)

This table assembles prescriptions and dimensions for the public frontage elements - curbs, walkways, and planters - relative to specific thoroughfare types within transect zones. Assembly combines the Curb, Walkway, and Planter for the various street types.

Transect Zone	TI T2 T3 T4 T5 T6	T1 T2 T3 T4 T5 T6	T1 T2 T3 T4 T5 T6
Public Frontage Type	ST-DR-AV-BV	CS-DR-AV-BV	CS-DR-AV-BV
Assembly: The principal variables are the type and dimension of curbs, walkways, planters and landscape.			
Total Width	12 - 16'	12 - 19'	18 - 30'
<b>Curb:</b> The detailing of the edge of the vehicular pavement, incorporating drainage.			
Туре	Raised Curb	Raised Curb	Raised Curb
Radius	5 - 20'	5 - 20'	5 - 20'
Walkway: The pavement dedicated exclusively to pedestrian activity.			
Туре	Sidewalk	Sidewalk	Sidewalk
Width	5 - 7'	7 - 10'	10 - 30'
<b>Planter:</b> The layer which accommodates street trees and other landscape.			
Arrangement	Regular	Regular	Opportunistic
Species	Alternating	Single	Single
Туре	Continuous Planter	Continuous Planter	Tree Well
Width	5' min.	5' min.	3 - 6'

Key	T# Allowed	T# Not Allowed

# Table 10-60.10.080.G Public Planting

This table shows common street tree types and their appropriateness within the transect zones. Title 18 of the *Engineering Standards* provides detailed specifications for landscaping within thoroughfares.

Standards

Illustration

**Recommended Species** 

T1 T2 T3 T4 T5 T6

Tree Shape: Oval

Placement: Spacing 20' - 35' o.c.

American Linden, Amur Maple, Black Locust, European White Birch, Green Ash, Quaking Aspen, Silver Maple, London Planetree, Freeman Maple, Flowering Pear

TI T2 T3 T4 T5 T6

Tree Shape: Ball

Placement: Spacing 20' - 30' o.c.



Alligator Juniper, Bird Cherry, Chokeberry, Crabapple, English Hawthorn, European Mountain Ash, Littleleaf Linden, One-seed Juniper, Western Redbud, Utah Juniper

TI T2 T3 T4 T5 T6

Tree Shape: Pyramid

Placement: Spacing 25' - 35' o.c.



Austrian Pine, Colorado Blue Spruce, Engelmann Spruce, Limber Pine, Ponderosa Pine, Eastern Red Cedar Juniper, Rocky Mountain Juniper, Scotch Pine, White Fir

TI T2 T3 T4 T5 T6

Tree Shape: Umbrella

Placement: Spacing 20' - 30' o.c.



American Elm, Northern Red Oak, Honey Locust, Gambel Oak, Flowering Cherry, Crabapple

TI T2 T3 T4 T5 T6

Tree Shape: Vase

Placement: Spacing 25' - 35' o.c.



Flowering Plum

Key

T# Allowed

T# Not Allowed

# Table 10-60.10.080.H Public Lighting

Lighting varies in brightness and also in the character of the fixture according to the transect zones. This table shows the types of light poles and fixtures that may be approved by the City Public Works Division assigned to the transect zones. However, the Public Works Division must be included in the selection of light poles and light fixtures.

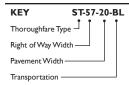
				0 1 0	
Transect Zone	TI T2	TI T2 T3	T2 T3 T4	T3 T4 T5 T6	T5 T6
Fixture Type	Cobra Head	Pipe	Post	Column	Double Column
Illustration					<b>*</b>
Placement					
Spacing	50' o.c.	50' o.c.	50' o.c.	50' o.c.	50' o.c.
Form					
Height	18' - 24'	14' - 24'	14' - 18'	14' - 18'	14' - 18'
Miscellaneous					
Luminance		see Division 10-	50.60 (Outdoor Lig	ghting Standards)	
Shielding		see Division 10-	-50.60 (Outdoor Lig	ghting Standards)	

# 10-60.10.090 Thoroughfare Assemblies

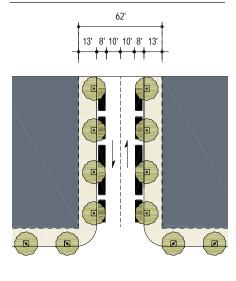
A. This section provides an example of thoroughfare assemblies that have been approved by the City for use in transect zones that are derived from the standards and specifications in Table 10-60.10-080.A (Thoroughfare Assemblies). The *Engineering Standards* also provide additional detailed specifications for the design and construction of thoroughfares.

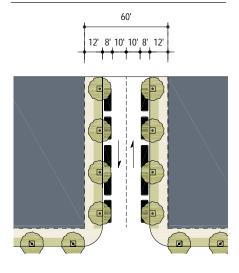
# **Thoroughfare Assemblies**

# Table 10-60.10.090.A Thoroughfare Assemblies



KEY	
Highway:	HW
Boulevard:	BV
Avenue:	AV
Commercial Street:	CS
Drive:	DR
Street:	ST
Road:	RD
Rear Alley:	RA
Rear Lane:	RL
Bicycle Trail:	ВТ
Bicycle Lane:	BL
Bicycle Route:	BR
Path:	PT
Passage:	PS
Transit Route:	TR





Thoroughfare Type
Transect Zone
Assignment
Right-of-Way Width
Pavement Width
Movement
Design Speed
Pedestrian Crossing
Time
Traffic Lanes
Parking Lanes
Curb Radius
Walkway Type
Planter Type
Curb Type

Landscape Type
Transportation

Provision

CS-62-36
Commercial Street
T5, T6
62'
36'
Free Movement
25 MPH
I0.2 seconds
2
Both sides @ 8', marked
10'
13' Sidewalk
4'x4' Tree Well
Curb
Trees at 30' o.c. Avg.

ST-60-36
Street
T3, T4
60'
36'
Free Movement
25 MPH
10.2 seconds
2
Both Sides @ 8', marked
15'
5' - 7' Sidewalk
5' - 7' Continuous Planter
Curb
Trees at 30' o.c. Avg.
BR

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